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# AIR WAR COLLEGE

## RESEARCH REPORT

SPACE CONTROL: A NATIONAL IMPERATIVE

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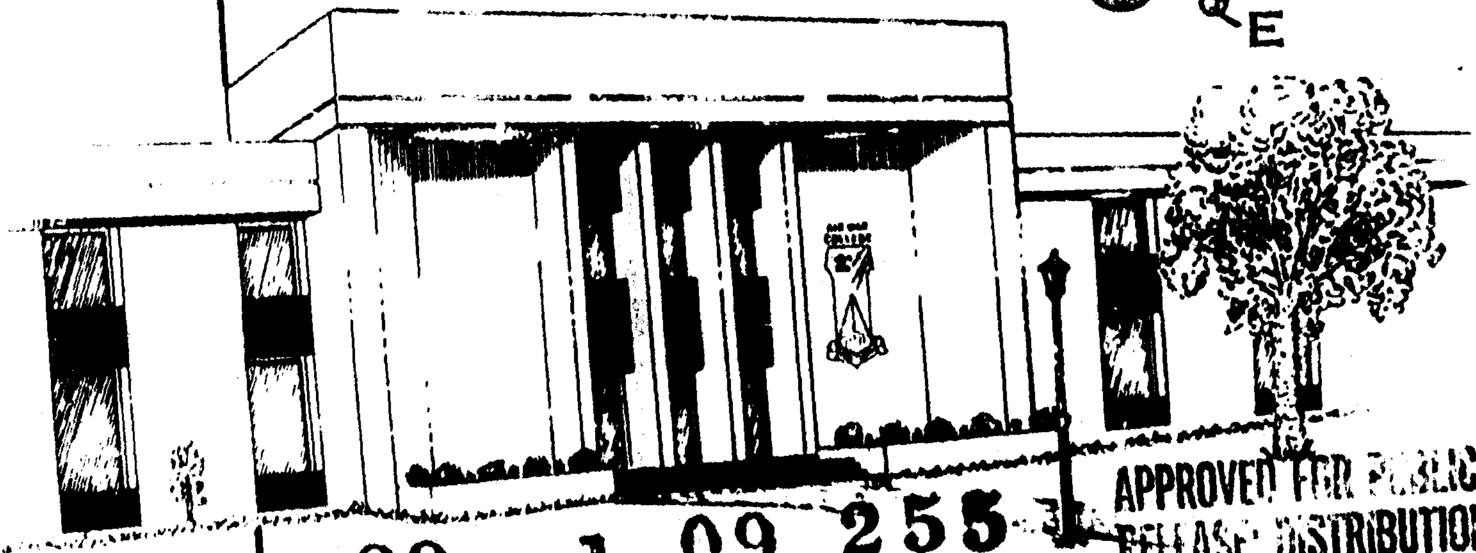

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# SPACE CONTROL: A NATIONAL IMPERATIVE

by

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*A RESEARCH REPORT SUBMITTED TO THE FACULTY*

IN

FULFILLMENT OF THE RESEARCH

REQUIREMENT

Research Advisor: Colonel Ted Schroeder

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## DISCLAIMER

## AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: Space Control: A National Imperative

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This report provides a discussion on various aspects of the new mission of space control--a mission which seeks to maintain access to and assure an ability to operate in space and, when so directed, deny such freedom to an enemy. In doing so, it first reviews some relevant history applicable to the space control mission. Then, it reviews the utility of space systems in supporting various elements of national security. After a brief review of the threat, the report discusses some dimensions of the policy debate between the executive and legislative branches of government over the proper investment path for the mission. Finally, the report seeks to provide a framework for developing a space control strategy as a foundation for defining future mission capability. Building upon existing national strategy elements of strategic deterrence, the Maritime Strategy, and the AirLand Battle Doctrine: the report discusses a potential approach to building a strategy for the space control mission.

## BIOGRAPHICAL SKETCH

Lieutenant Colonel Raymond H Barker, Jr (BS and MS, Virginia Polytechnic Institute; Post Graduate Diploma, von Karman Institute; PhD, Air Force Institute of Technology) has had a keen interest in space systems and in the development of military strategy throughout his career. He began his active duty at the Minuteman Program Office, developing targeting and force application software. He has served as Chief, Orbital Operations for Communications Satellites at Sunnyvale Air Force Station, CA. He has also performed duties at Headquarters USAF, working tactical defense suppression issues. During the past four years, he has served on the staff of Air Force Space Command, Deputy Chief of Staff for Plans as Chief of the Space Defense Division. He is a distinguished graduate of the Air Command and Staff College. Colonel Barker is a graduate of the Air War College, class of 1988.

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## PREFACE

We are entering an era--if we have not already--when the use of space will exert such a profound influence on human affairs that no nation will be fully able to control its own destiny unless it possesses significant space capabilities. (22:1)

The medium of space offers major advantages for systems performing such key national security functions as communications, surveillance, missile launch detection, navigation, geodesy, and weather monitoring. (3:4;5:47;36:1;44:13-14;45:38)

Access to space and the freedom to operate in space are becoming increasingly important to our ability to deploy and employ military forces worldwide--to deter potential aggressors from initiating or escalating armed conflict. (57:11)

These factors played an important role in the decision to assign the space control mission to the United States Space Command--to assure an ability to maintain access to and operate freely in space and, when so directed, deny it to others.

But many do not fully understand the growing need to develop a capability to execute this new mission. Such an understanding is fundamental to developing a space control capability, especially in an era of declining national defense budgets. What course should we pursue to ensure our inherent right to self defense in space? How must we invest our limited national resources to be certain of a future where other, more aggressive nations might exploit their expanding space capability?

These issues cannot be adequately addressed without a coherent strategy--one comprehensive enough to examine the elements of mission utility and simple enough to articulate to lay decision makers and to the public.

It is the purpose of this paper, therefore, to explore some dimensions of the space control mission and identify the challenges it poses as we look to the future. In doing so, it will first briefly review the history which has led us to a point in time when such an examination is prudent and necessary. Then it will discuss a number of issues central to understanding the need for space control.

What contributions do space systems make to our national security? What are the dimensions of the threat? What aspects of the policy debate are important? What approach

should we use to build a strategy for future investment in this mission area? While a comprehensive study answering all these questions is beyond the scope of this report, hopefully it can contribute to the reader's appreciation of the space control challenge. If it raises awareness and points in the direction of solutions, it will have served its intended purpose.

# CHAPTER I

## BACKGROUND--A BRIEF HISTORY

Over the past two centuries, military power has been a key element in providing for our national security. To a large degree, the way we structured our military forces has been shaped by those we identified as our enemies and our assessment of their capabilities. This assessment was influenced by the weapons and technology available to us and how keenly we applied that technology with well developed strategies to achieve our national security objectives. (1:4)

In the 1800s, the threat came primarily from Europe. The great distances over the ocean provided the US with a sense of security. Mounting an attack was expensive and time consuming. The circumstances of the times were such that the "island fortress" of the continental United States dominated our perceptions. As a result, we developed military forces to defend against the armies of potential adversaries and against their navies along our coastlines. (1:4)

As the industrial revolution rolled on, we combined the new technology of steamships with our commercial need for expanding trade to build a navy capable of projecting power to control the seas. (1:4;28:117) Building upon the historical lessons so finely articulated by Alfred Thayer Mahan (27:vii),

we charted a course for our national military strategy which has served us ever since--an ability to project naval power globally in pursuit of our interests.

The evolution of the airplane as a weapon of war grew out of the combat experience of World War I. Immediately after the war, there was a vigorous debate about the military role of airpower versus our national investment in more traditional land and sea forces. (38:30) Recognizing its inherent advantages of speed and range, we ultimately adopted a doctrine of strategic bombing that served us well during World War II. (38:31)

The combat experience of two world wars also highlighted the critical need to establish air superiority as a fundamental prerequisite to fully exploit the potential inherent in the application of air power. It also brought the lesson that a great power could no longer neglect to develop any one of the then existing three elements of military power--air, land, and sea. (47:41)

Military activities in space have also developed in an evolutionary manner. Over the years rocket development progressed, until 1957 when the launch of Sputnik I shocked the world and focused our attention on the feasibility of the Soviets moving ahead in the conquest of space. Although a

small national research and development effort was underway in 1957, the launch of Sputnik I in October provided the primary stimulus for an enhanced US thrust into space. (45:32) Between 1957 and 1963, early policy foundations were laid for the US military space program. (45:33;68:8)

US policy makers pursued an approach which became known as the "open skies" policy. They vigorously promoted the use of space for non-aggressive, peaceful purposes. Concurrently, the US reduced the public profile of its military space activities and attempted to show restraint in the development of weapon systems for use in or from space. (45:33;68:25)

We envisioned exploiting space for its strategic potential--its global reach giving us access to places no longer easily accessible by other means. Early US satellites concentrated on providing critical data for strategic purposes. (44:236) These systems ranged from treaty monitoring devices to increasingly more efficient communications satellites which provided improved connectivity between National Command Authorities, US diplomatic posts, and forces in the field. (43:19)

However, over the past 20 years there has also been a significant increase in the use of satellites to support general purpose forces--so much so, that forces today are

dependent on information derived from, or transmitted, by satellite. (43:19;44:242;57:11) These data range from intelligence data collected in peacetime, real time data, the worldwide dispersal of warning data for our forces, and critical communications links, so necessary for maintaining positive control in an increasingly complex political and technical age. Space systems have enabled commanders to more efficiently use their forces by providing global surveillance, communications, weather data, and navigation. (2:4;3:4;43:19)

These facts begin to illustrate the need for the space control mission--to assure an ability to operate freely in space, and when so directed, to deny that same opportunity to an adversary. But, just how extensive is the use of space systems? How well understood is their growing utility?

## CHAPTER II

## SPACE AND SPACE SYSTEMS--THEIR GROWING IMPORTANCE

Space systems can contribute across the spectrum of national security instruments--political, economic, military.

On the political and economic fronts, space systems can support a wide range of activities. Communications satellites can tie together world finance centers, investment organizations, international trade associations, and our trading partners throughout the world. (65:11) Without reliable, secure communications, we could not conduct arms negotiations with anywhere near the pace observed during the recent INF negotiations. Similarly, without space systems we could not effectively verify arms agreements. (43:18)

Space systems can support the US government information programs on a wide scale. They can tie together the efforts of the government policy makers and those agencies who make known our democratic principles throughout the world--the US Information Agency, the Agency for International Development, US Trade Representatives, and many more. (65:13)

Using key space systems, political consultations with our allies in Europe can proceed with dispatch and efficiency. Indeed, in a world ever expanding with real time

communications, it is sometimes imperative to rapidly relay diplomatic and military information back from sensitive areas to inform our decision makers before they see televised reports on the network news.

Space systems can be used to implement regional policies around the globe. They support our security assistance personnel. They can be used to transmit data to friendly governments about terrorists, insurgents, and drug dealers. (65:7,14) Communications and remote sensing from space can play important roles in the economic and political development of many Third World nations. Satellites span many barriers--providing inexpensive communications, education and medical information, identification of transportation routes, early warning of severe weather, predictions on crop yields, locating natural resource deposits, and more. (14:14)

Space systems are integral instruments in providing secure connectivity over long distances across the Atlantic and Pacific. Is it not prudent to tie our regional security alliances into the information so necessary to assure their security? Vital information can rapidly be made available to NATO partners, Japan, Korea, etc. Working in harmony with a host of other assets, space systems can contribute in helping foreign governments maintain stability in world hot spots.

Space systems that are so useful for our national security posture in peacetime and crisis become vital military resources, should deterrence fail. They are important elements in the national military strategy of keeping conflict at the lowest levels and bringing about war termination on terms favorable to the US and our allies. Space systems provide the primary US missile launch detection capability. (43:18) Over 70% of long haul military communications travels by satellite, with over 90% of this traffic on commercial, as opposed to dedicated military satellites. (60:1)

Satellites are important instruments for monitoring and verifying compliance with treaty obligations, but these same systems would be used to distribute critical data to US and allied forces in crisis and war. Communications satellites disperse intelligence data to ground, air, and fleet operations. Its loss could deny targeting data needed to successfully execute the US Maritime Strategy and the AirLand Battle Doctrine. Without spaceborne assets, long range attack aircraft performing counter air missions deep behind enemy lines could also be denied important targeting data. (43:19)

What began as a requirement to largely support strategic deterrence has now grown--to encompass all potential levels of conflict. Space systems once thought so useful in

peacetime--are becoming increasingly more useful in improving the combat effectiveness of military forces worldwide. (44:242) The evolution in their technical sophistication and their military applications transcends peace and war, strategic and conventional conflict, non-aggressive and aggressive uses. It is easy to envision why spacecraft have become so important to our national security. However, inherent in their utility is an ever increasing value as potential targets during crisis and war. (44:243,253;57:7)

Means to attack satellites have also evolved over the past three decades. Initially, nuclear weapons were the only available antisatellites (ASATs), with the attendant problem of generating collateral damage to other space systems. (31:81) Now, more discriminating weapons have been developed. At the current time, we stand on the threshold of seeing directed energy weapons being deployed, systems which can attack orbiting spacecraft with the speed of light. (63:20)

US military dependence on space systems is critical and growing. (43:20) Since World War II, we have sought to deter aggression with forward deployed forces, augmented by rapid mobilization and reinforcement. (43:17) Space systems are integral pieces of that strategy. A loss of US capability to support its forces from space and allowing an adversary a

sanctuary in space from which they can target US forces will place limited US personnel, aircraft, ships, and ground forces at great risk. (43:19;66:3) Clearly, space systems could be critical targets in a host of scenarios--a theater war, a worldwide conventional conflict, during the critical stages of escalation before a central nuclear exchange.

As we look to the future and potential changes in the composition of US military forces, space systems are likely to take on more important roles.

But...why? Why are space systems becoming so integral to US force projection capability--to global mobility and rapid response to contingencies? Why should we be aware of their potential to both assist and to threaten future military forces?

Envision if you will, the following scenario.

US air and naval forces mobilize to support a fast building contingency overseas. Command and control links are established between the National Command Authorities and the theater CINC. Intelligence data is collected by US systems and transmitted via satellite to support the AirLand Battle and deep strike targeting. US Global Positioning System (GPS) satellites provide precise time and position data to US and

allied forces. (53:1-2) Defense Meteorological satellites provide critical weather data to deploying forces. (5:50)

The Soviets are not yet actively engaged with US or allied forces, but are acting instead through surrogates in the region. They do, however, begin carefully selected, non-destructive interference with US space systems, significantly degrading their operations. Ground based lasers blind the sensors of one critical satellite. Jammers attempt to blank two key connectivity links.

Realistic? Perhaps. Would we detect the interference or would we think the satellite had mechanical problems? If we confirmed Soviet interference, how would we react?

Consider another scenario.

A mechanized infantry division at Fort Carson, Colorado receives its deployment order. Equipment and weapons are loaded onto trains. Soviet satellites track the rail transport across the country to ports of embarkation. Soviet ground agents relay critical details on the convoy type, size, and date of sailing directly to the Soviet Union. Other agents relay data from various US sites on airlift and sealift activities, tipping off troop departures.

Electronic ocean reconnaissance satellites (EORSATs) and radar ocean reconnaissance satellites (RORSATs) track the convoy across the Atlantic. Communications to Soviet attack submarines and aircraft provide targeting data to Soviet forces. Transiting the expanse of the Atlantic Ocean without escort due to limited resources, key elements of US reinforcement are stopped short of their destination. At a very minimum, the US stands to lose its advantage of tactical surprise while attempting to achieve its military objectives.

Plausible? Perhaps. Possible? Certainly, if not now, then in the near future. What would US response options be?

Or, consider a third scenario?

US and Soviet forces are engaged in conflict in the Persian Gulf, the war expands horizontally to the NATO theater, a loss of key carrier battle groups has crippled our Maritime Strategy in the northern Pacific. Jamming attempts against US communications and navigation satellites have been intense. Both sides are near exhaustion and considering options for using their strategic arsenals.

Do we have confidence in our ability to command and control US forces? Would we feel secure in our connectivity such that we

could stop force generation if both sides sought to halt the conflict short of a central nuclear exchange?

These questions illustrate the challenge we face as we consider the space control mission. Many are aware of the contribution of space systems in peace and crisis. Few are aware of their growing contribution to military operations worldwide. Many have come to understand their utility for providing warning and communications for strategic attack. Few are aware of their ever expanding role in supporting force projection almost anywhere in the world. Few are aware of their potential role as instruments in limiting escalation of conflict at the lowest level.

Given the appropriate circumstances, would adversaries be easily dissuaded from attacking US assets simply because they reside in space? Or, would they make a carefully considered decision to engage based on the contribution of the target to the air, land, and sea battle? (32:13) Such a decision could surgically disable a key element of the US force structure. US escalation may or may not be appropriate, but should not the nation have a choice of response options? (66:1) Should our only choice be to escalate conflict to attack the Soviet homeland or to the nuclear level? What should our choices be?

These issues frame the debate for a part of the space control mission--a mission predicated on sustaining our operations in the face of a determined enemy. But just who is this potential adversary? How capable is he against the US capability in space? What threat is posed from space to US and allied forces at sea, on land, and in the air?

# CHAPTER III

## AN INTERPRETATION OF THE THREAT

In the 1950s, many thought of them as the "dumb Russians". (43:1) Then in 1957, they burst onto the world scene with the first successful earth satellite, demonstrating a prowess not only in the domain of space, but also in the technology needed to launch intercontinental ballistic missiles (ICBMs). Such a breakthrough had the potential to change the strategic relationship between the two superpowers.

So dramatic has been their progress in these two arenas, that knowledgeable authorities suggest that Soviet status as a world superpower rests solely on their prowess in space and their impressive array of ICBMs. (21:1)

Just how extensive is the Soviet capability in space? Not as technically sophisticated as US space systems, Soviet capability is impressive in terms of their force structure. They have over 50 different types of satellites. (43:6) They maintain twice the variety of launch vehicles as does the US. (43:iii) They launch five times the number of spacecraft we do annually--averaging a space launch every three to four days. (43:iii,12)

Their launch infrastructure is sufficiently robust to reconstitute their entire on-orbit population of 150 satellites in a few months. (43:111;59:1) With approximately 100 space launches a year (43:6) and over 400 missile launches each year (6:441), they've demonstrated a resiliency in numbers alone. They've launched over 70% of the world's space payloads and over 80% of the world's space boosters. (59:1)

Over 90% of Soviet spacecraft are military or military related. (43:6) The entire Soviet space program is dominated by the military. All five military services are deeply involved in space operations. (59:2)

The Soviets have the most extensive manned space program in the world today. They have a permanently manned space station in orbit (43:111) and recently set a new endurance record by maintaining the same cosmonaut on-orbit for 326 consecutive days. (29:15) Their knowledge of the physiological affects of space travel far exceeds that of any western nation. They are evaluating unique human capabilities to locate, track, and identify US and allied forces worldwide. (43:9) The military potential of their MIR space station or other manned spacecraft cannot be ignored.

They demonstrated their extensive manned operational experience by reactivating the dormant Salyut-7 spacecraft in

June of 1985. (41:52) The Soviets are rapidly expanding their capability to service a permanently manned presence on orbit--both for the natural advantage of earth observation and to prepare for a manned flight to Mars. (6:458)

Beyond the manned presence in space, the Soviets have an impressive array of remotely controlled, unmanned sensors for locating and targeting US and allied forces. Their RORSATs and EORSATs stand as unique resources in the world today. The US has no counterparts. (43:7) RORSATs and EORSATs could provide real time targeting data, allowing Soviet weapon platforms to attack US and allied surface fleets. (66:3)

Soviet photo imagery reconnaissance satellites and electronic intelligence (ELINT) satellites can also be used to provide data on US and allied forces. (66:3) The routine use of Soviet spacecraft for these purposes during crisis and in exercises provides ample evidence of their intended application for wartime. (43:7) If they are able to use their satellite data relay capability (42:54), targeting and intelligence data could be rapidly transmitted to allow Soviet forces to more effectively confront deploying US and allied forces. (43:7)

Not only do the Soviets possess the capability to target US and allied forces from space, but they also have developed an

array of different ASAT capable weapons. The Soviets have the world's only dedicated, operational ASAT system. (43:11) This system, a ground launched co-orbital interceptor, has a demonstrated capability to attack low altitude satellites. Operational since 1971, it is launched on top of an SL-11 booster--one constantly exercised by launching other space payloads. (43:4,11) Some assessments suggest that the Soviets could launch several co-orbital ASAT interceptors in a single day using its inventory of boosters stored at Tyuratam. (48:88-89)

The Soviets also have ground based laser systems capable of damaging critical components of low altitude US satellites, plus the technical capability to jam US space systems. (43:11)

The Soviets are also striving to expand their launch capability. They are developing a heavy lift space booster, which can place over 100,000 kilograms into low earth orbit. Projections suggest the Soviets will have a space boost capability twice their projected requirements by the year 2000. (43:111) With a projected on-orbit force of 200 satellites by 1995 (42:53), why would they be further expanding such a robust launch system?

As they have in other fields, the Soviets have become very adept at exploiting western technology, improving on its

capability and fielding new generations for their military applications. The space arena is no exception. In the 1970s during the age of detente, we allowed the Soviets access to the US space shuttle design. In their normal fashion of exploitation, the Soviets improved on the design to facilitate more efficient launch and landing operations. (6:452)

The Soviets obtained copies of digital signal processing documents from the GPS satellites and applied the technology to help build their GLONASS navigation satellite. (43:7) The GLONASS could be used to improve the effectiveness of Soviet strategic and tactical forces, including targeting of their ICBMs, SLBMs, bombers, and cruise missiles. Did this piece of espionage assist in improving a hard target kill potential? (48:85)

The Soviets are also developing a new radar mapping satellite of their own which can be used to map the ice formations. They've already tested this system by transmitting radar data through their EKRAN television satellite to users in the polar region. (43:8) Their imagery and ELINT capabilities are constantly improving. (43:7) How long will it be before they begin to exploit foreign commercial technologies such as the Japanese MOS-1 thermal radiation satellite, whose remote

sensing can be computer enhanced to provide pictures with crystal clarity? (37:C1)

Not only do they have impressive military space capabilities, but the Soviets are trying to exploit other aspects of their space program for maximum economic and political payoff. They have offered their highly reliable Proton booster as a competitor against Chinese, European Space Agency (ESA) and potential US commercial boosters. (46:66) They have demonstrated a 95% success rate to orbit over the past ten years (59:1)--an impressive statistic in the face of recent US and ESA launch difficulties. The Soviets are also in the process of selling high resolution earth satellite imagery for commercial applications. They have over 100 filings with the International Frequency Registration Board for over 25 positions for future satellites at geosynchronous altitude. (43:7)

Exploiting their highly visible role in space, the Soviets have hosted international space conferences. A French space official recently was quoted as saying, "The seminars that ten years ago would have been given at the Goddard Space Flight Center are now given in Moscow." Former NASA Administrator, Mr James Beggs said, "There's a habit in this country of thinking of the Soviets as stupid and that they steal all

their technology. That's simply not so." Space experts from the US and Europe are now publicly conceding that they have surged past the US; American preeminence no longer exists. (46:65)

Their radar technology on the 1983 Venus probe shocked western experts with its capability. (46:67) Their planned probe to the Martian moon Phobos in 1988 will exceed US accomplishments. Launching a cruise missile like probe, the Soviets will guide it to within 98 to 260 feet of the moon's surface. The Phobos probe will carry over 25 different sensors compared to 16 aboard the highly successful US Galileo probe to Jupiter. (46:68)

These many facts provide ample evidence of Soviet capability, but taken alone they appear only as static indicators of the potential threat within the Soviet space infrastructure. Overall, the capability is impressive, and provides tremendous payoff for Soviet military, economic, and political interests. The Soviets undoubtedly have their space systems highly integrated with their combined arms plans and operations. (20:47;34:56)

They can use an array of ASAT systems to deny essential US space capability. They can deny US and allied commanders an understanding of an increasingly complex multi-dimensional

modern battlefield. The demonstrated Soviet surge capability and extensive support infrastructure provides them a tremendous advantage of momentum over western military space capability. During the Falkland Island conflict, the Soviets launched 28 space boosters in a 69 day period. (34:56-62)

Soviet military doctrine--a foundation for their force structure development--is to attain and maintain superiority in space, to deny space to other powers and to assure the maximum support to Soviet offensive and defensive operations on land, at sea, in the air, and in space. (43:5)

Aligned against the US and our allies is the most extensive, robust, and dynamic space program in the world today (43:1)--one the Soviets are not likely to slow down. Even in an age of glasnost and perestroika in the Soviet Union, if Gorbachev is successful, he will simply exploit western technology to push further ahead. (13:44) His true intent was demonstrated at Tyuratam in May of 1987 when he said, "We do not intend to relax our efforts and lose our vanguard positions in the conquest of space." (43:4)

But just how important are these facts to our concern for building a sound foundation for our future national security? Is there a wide appreciation of the challenge this capability poses for our national interests?

# CHAPTER IV

## THE POLICY DEBATE

Cognizant of the threat, the US Congress has been embroiled in a debate over the appropriate path for the nation's military space capability. (26:16;54:H3662;55:S2921;56:S10798) Much of the recent policy debate has centered around Congressional concern for the US deployment of an ASAT weapon. It has crystallized arguments, pro and con. But do they have a clear understanding of the military objectives we hope to achieve with the space control mission? Is there a complete understanding of how space control supports our overall national military strategy? Is Congress simply asking for a more comprehensive look at the mission?

Congress has imposed a constraint on the development and deployment of US ASAT weapons which directly inhibits building a capability for space control. They have consistently denied funds for production and deployment of an operational weapon, since its first and only successful test against a space target in September of 1985. They have restricted the US military from testing the ASAT against an object in space, unless and until the Soviets resume testing of their dedicated ASAT weapon. (54:H3671)

And the Soviets are showing increasing sophistication, maintaining a hiatus in testing their full up co-orbital system since 1983 (56:S10806), thus playing on the hopes of Congress to thwart US deployment opportunities. (66:2)

Strong support from the executive branch for the ASAT system has been muted by Congressional criticism of the Administration's approach to space arms control. Concerned by the difficulties of verification and the possibilities of Soviet breakout from a treaty with a small number of weapons, the White House has yet to identify a space arms control proposal suitable to our national security interests. (64:1) Some also suggest a concern of limiting potential progress in the Strategic Defense Initiative (SDI). (56:S10807)

Why does this controversy exist? Is the Congress merely searching for ways to cut the defense budget? Are they adequately informed on the Soviet space control capability and the circumstances under which that capability might be exercised? Has the Administration overlooked a possible arms control strategy?

If we look a bit deeper into the floor debates of the House and Senate on the ASAT issue, perhaps we can gain some useful insight into the honest differences of opinion among the various arguments--and maybe answers to some of these

questions. The specifics of the debate reflect a keen concern over whether an ASAT weapon is truly in the interest of US national security.

Some suggest deployment of the ASAT would allow the US to gain unilateral advantage, accelerating the arms race into space. (56:S10798) Others suggest that the US is more dependent on satellites than the Soviets, therefore, we should not deploy and provoke a more sophisticated response from their side. (30:79;56:S10807) Still others, argue that it is important to restrict the Soviets to their current low altitude ASAT capability. It is not in US interests for the Soviets to develop a capability to attack critical warning and communications satellites in high altitude orbit--systems so important to control of escalation. (56:S10805) Many agree with this assessment. (32:16) And yet, there are many different perspectives on the proper path to achieve such a restriction. Some suggest arms control is the answer. (54:H3663) Others point out verification difficulties. (56:S10804;57:23) How do you verify the power level of a ground based laser in order to be certain that a determined enemy could not degrade your satellites at high altitude?

Despite strong recommendations from the Air Force Chief of Staff, the Chairman of the Joint Chiefs of Staff, USCINCSPACE.

and the Director of the Arms Control and Disarmament Agency; Congress has still sustained its restriction against the testing of the US ASAT system. (56:S10803) Just recently, this action resulted in the Department of Defense reluctantly canceling the current US ASAT program. (35:3)

This debate is not without precedent in US history. Mahan pointed out that popular governments are not favorable to new military expenditures at the time he advocated for a national commitment for sea control. (27:vii) Others suggest that we are at a juncture in history similar to 1915-17, when the combat role of aircraft had not been proven--yet its increasing value to the conflict provided just the incentive necessary to make airplanes lucrative targets in World War I. (15:40)

Just as in those times, we in the US military have not done a very good job of articulating the need for new military capability. To date, we have not developed rationales and strategies for space control sufficiently convincing to overcome political obstacles. Congressman Brown of California illustrated his understanding of our military planning for an ASAT in his remarks during the floor debate of May 19, 1987.

> The fact of the matter is that we do not have a tactical plan for our ASAT. We do not have rules of engagement for our ASAT.

> The appropriate staff members of the Joint Chiefs of Staff have briefed me, and they have no current tactical doctrine for using the ASAT. (54:H3669)

Is there any wonder why the weapon system cannot sustain support? Its true military merits are lost in a debate about its utility. The debate suffers from a lack of clarity because we have not developed a comprehensive strategy within which the utility of such a weapon could be carefully evaluated. If we have developed such a strategy, we have not convincingly articulated its merits to Congress.

When one stands back and attempts to objectively evaluate this debate, it becomes clear that it has resulted in a policy of legislative arms control on space weapons. This policy derives from a coalition of arguments which are clearly voicing well-intentioned desires to define the proper path for US military capability in space.

But where does this situation leave us? As B H Liddell Hart suggested, the perfect strategy is one which allows achieving one's ends without fighting. (17:324) Soviet moves have helped to convince Congress we do not need an ASAT. In an age of glasnost, they are likely to continue. Sun Tzu also said that those skilled in war bring the enemy to the battlefield and do not allow the enemy to bring him to battle. (16:96) Again, it seems the Soviets have succeeded. It seems the

Soviets have successfully disarmed the US in space without striking a blow.

The Soviet strategy for space control seems very clear. They recognize that in a sophisticated age it may be easier to deny than to control. (47:335) They have developed a strategy which is much broader than just the operational level of force employment. Their arms control and political efforts have been successful in helping to deny the US an ability to deploy an operational ASAT system. Their own force structure stands ready to deny US freedom to operate in space during conflict--witness their variety of ASATs. (34:62) In selected scenarios, their space surge and replenishment capability could be used to respond to our attempts to deny their freedom to operate. (34:58)

Whether one agrees or disagrees with the need for an ASAT, it has become clear that we must define and articulate both a rationale and a strategy for the space control mission. Such a strategy must be defined in the context so eloquently articulated by Karl von Clausewitz,

> ...namely that war is waged by a 'remarkable trinity' of the government, the armed services, and people. 'A theory that ignores any one of them or seeks to fix an arbitrary relationship between them would conflict with reality to such an extent that for this reason alone it would be useless.' (8:41-42)

Acknowledging this wisdom, we must define a blueprint for space control by developing a strategy mutually acceptable to the military, the executive, and the legislative branches of the government. There clearly is a potential that such an approach would be accepted by the Congress. One can read that potential in the remarks of Senator Bumpers during last year's debate on the ASAT program.

> ...it was recognized that arms control could not eliminate all antisatellite weapons. However, appropriate arms control restrictions, coupled with programmatic options like satellite hardening, electronic countermeasures, and maneuver tactics could restrict the most militarily useful ASAT options. Again, arms control alone cannot solve the whole problem, but it can make a contribution to at least bound the problem.
>
> ...if your goal is to eliminate all ASAT threats to satellites you may as well give up. (56:S10806)

We must capitalize on this potential by establishing a clear strategy--one simple enough for lay decision makers to comprehend, yet detailed enough to guide development of US military capability. A coherent strategy must consider the potential evolution of future threats beyond those of the Soviet Union, potential changing dimensions of current and future US military strategy, and real world constraints likely to be imposed on future military budgets. A tall order? Perhaps.

But, the alternative is clear. Without a coherent and clearly articulated strategy, we cannot hope to successfully advocate for new space control capability.

What are the least costly approaches? Which analogies from sea control and air superiority can appropriately be applied to the space control problem? How do we exploit enemy weaknesses to deny his freedom to operate once deterrence has failed?

History is filled with examples of great nations who failed to develop one dimension of military power. This failure was invariably exploited as a critical weakness. Great nations must be able to absorb and deflect the blows of an adversary, even if it comes from their enemy's strength, and deliver decisive blows in response. Each must protect its own vulnerability. (47:41) In the words of Giulio Douhet,

> Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after changes occur. ...Those nations who are caught unprepared for the coming war will find, when war breaks out, not only that it is too late for them to get ready for it, but that they cannot even get the drift of it. (12:30)

The US has great traditions in land, sea, and air power. We need to build the same tradition for space, not unto itself,

but in harmony with an integrated US and allied force structure to better deter and fight, now and for the future.

How would we approach such a task? How do we define such a strategy while recognizing the contraints imposed by the current policy debate, our national perceptions of the threat, and real world fiscal limitations?

## CHAPTER V

## BUILDING A SPACE CONTROL STRATEGY

Building a strategy for space control poses many challenges. First of all, developing a complete strategy requires access to and discussion of highly classified information. While this circumstance is characteristic of most military activities it is particularly true for space systems--both US and Soviet. None the less, we can develop an approach to building a space control strategy--a framework or blueprint which can guide future national investments.

Once complete, details of the strategy can be made available to those with an appropriate need to know. But, as we discussed in the previous section, it is extremely important to define a carefully developed, unclassified strategy whose merits can be sufficiently argued to help build that "trinity" of concurrence among the military, the government, and the people so necessary to support any nation's war winning capability. (8:41-42)

As we embrace this challenge, we also need to acknowledge that a systematic approach is necessary to complete the task. A systematic development provides a framework within which the merits of the individual elements of the strategy can be evaluated. All elements are not likely to be equally

important. All elements are, however, likely to be interrelated. (47:1)

The strategy cannot be developed independent of constraints--be they fiscal, technical, political, or operational. Of necessity, it must balance many different factors. Following the framework described by Thibault, the elements of a strategy can be separated into five groups: context, objectives, assumptions, capabilities, and costs. (47:1-5)

1. What is the context for space control?

*The context provides the environment* within which the strategy must work. The early sections of this paper were developed to provide some of that context. We are considering the new mission of space control. A number of historical factors have led us to the point in time where such a consideration is prudent. Many people are aware of the contribution that space systems have made to our national security--political, economic, and military. Their knowledge of the use of military space systems may be more concentrated on the use of such systems in peacetime or for support of our strategic deterrent, perhaps not of potential applications in support of actual combat. The Soviets possess significant capabilities

in space. There is a continuing policy debate over the proper path for the future of this mission.

Another important dimension of the "context" is found in our understanding of the threat to our space systems. The earlier summary provided some information on the numerical dimensions of that threat, but very little insight into its dynamic character. Any coherent strategy for space control must be built on our most intimate knowledge of Soviet capabilities and their intent to use those capabilities in wartime. Only with such insight can we hope to identify weaknesses such that they can be exploited with our strategy--a strategy which can then be used to "reduce the fight to its slenderest possible proportions." (17:324)

If we hope to build a perfect strategy, we should strive to achieve our objectives without conflict. As Sun Tzu said, one should seek war only when the enemy cannot be overcome by other means. One should seek victory in the shortest possible time, with the least cost in lives and effort, and while inflicting the fewest casualties. (16:39) A perfect strategy would subdue the enemy without a fight. (17:324) Indeed, this in many ways describes the US military strategy versus the Soviet Union since World War II.

The national strategy of deterrence in combination with our allies abroad has served us well. The forward deployment of troops, our ability to mobilize and reinforce those forces, and our ability to project power globally are all elements of that successful military strategy. (65:3) It is in this context, that the utility of space systems must be evaluated. In this context, what threat do Soviet space systems pose to US and allied forces?

Presently, low altitude Soviet satellites pose the principal threat to US and allied forces. (32:9) The magnitude of this threat will increase as real time targeting capability increases. (32:10) Similarly, the Soviet ASAT threat to low altitude US satellites is of most concern, although the growth to high altitude capability with speed of light weapons such as lasers and jammers must be given careful consideration. (32:11)

When would the Soviets most likely employ these assets? When one considers Soviet doctrine, it seems apparent that they would most likely be very conservative in their application--when US and Soviet forces were engaged in direct conflict in a theater war or in a worldwide conventional conflict. (32:13) If they desire to pre-emptively attack US and allied forces in an attempt to prevent escalation to a

strategic nuclear conflict (18:71), it seems most likely for them to strike targets most immediately influencing the conflict and, not to escalate, and engage high altitude warning and communications satellites which might prompt a US strategic response.

The above approach begins to build a framework for developing a strategy for space control. But before we further discuss that framework, let us first consider some definitions which add to the context--the first step in our process.

The very title "space control" connotes unbounded dimensions, both in magnitude and cost. Space control does not mean the conquest of space. (19:41) *Its very vastness precludes any* nation from achieving that objective. Space control also does not mean space superiority. It is doubtful if the political, fiscal, technical, and operational freedoms exist for any nation to be allowed to establish and maintain space superiority.

Space control must be thought of as being local (19:41) and, very likely, temporary. While strict analogies are not appropriate, there are at least two analogies which are instructive for discussing the dimensions of the space control challenge.

Space systems are constantly in motion and, except for geostationary satellites, they are constantly changing position relative to each other and relative to the terrestrial conflict with which they may be associated. As a consequence, many of the "principles of war" developed for terrestrial forces do not apply--at least not in the same manner. (19:40) We cannot easily concentrate force with the use of space systems, but we can potentially provide an "economy of force" by exploiting their particular application at a point in time, in a specific location.

Because of these features, when we think of space control, it is often useful to think of an adaptation of the naval concept of sea control. Sea control seeks to achieve freedom of operation for naval forces and to deny it to the enemy. In large part sea control is protecting valuable lines of communication (our freedom to operate) while denying the enemy from establishing barriers to friendly naval operations. (47:162)

Space control also seeks to assure freedom for friendly forces to operate and to deny the same advantage "selectively" to an enemy. While space systems provide global reach and coverage, space control does not, necessarily, need to be established globally. Just like local air superiority, we simply seek to

establish our right to operate friendly systems and to selectively deny the enemy that right at the time and location which has a direct influence over the area of the globe where space systems influence air, land, and sea combat.

In short, what this means is that space control can be divided into achievable objectives which have maximum contribution to our national security interests. It may mean that high altitude communications and warning satellites are sufficiently protected with a combination of survivability features to function in today's world--laser and nuclear hardening, antijam capability, maneuver, etc.

It may mean that medium altitude satellites such as the GPS can be sufficiently protected with similar devices and placed in an orbital constellation of sufficient numbers to gracefully degrade while under attack. (53:3) It may also mean that low altitude satellites, which move very rapidly in space (about 17,000 miles per hour) need to be protected only for a very short period of time, but with techniques which do not interfere with their mission.

It may also mean we will have to choose among a variety of options to deny an enemy an ability to achieve his objectives. We must determine which means of denying enemy space based

systems contribute most to deterrence and provide the most suitable elements for our strategy should deterrence fail.

These are the issues which must be examined as we assess the details of a space control strategy.

2. How do you define objectives for the space control mission?

Military space systems are only developed to support US military strategy, and then, only if they can accomplish a unique portion of the mission in a more efficient and cost effective manner than alternatives. (4:1) Our ability to deny the enemy use of his space systems and our criterion for deciding on the degree of protection we should afford to our own systems should be based on the overall US military strategy we seek to execute. For simplicity sake, consider three principal elements of US military strategy: strategic deterrence, the Maritime Strategy, and the AirLand Battle Doctrine.

Our strategic forces and their associated targeting policy exist to insure that potential enemies clearly perceive that initiating a nuclear war would be unacceptable and unrewarding to their interests. Our deterrent posture seeks to deny Soviet military objectives by holding at risk their warmaking capabilities--essential political leadership, military forces,

and war supporting industry. (65:21) Space control objectives should be defined in harmony with their contribution to supporting this element of our national military strategy. Which space systems are integral elements of that strategy? How long should they survive to carry it out?

Similarly, the US Maritime Strategy seeks to maintain a peacetime presence throughout the world, to contain and control conflict if it erupts, and to counter preferred Soviet strategies by occupying Soviet forces in global conflict, by seizing the initiative and carrying the fight to the enemy. (61:2-17) Which space systems support the national Maritime Strategy? How would they be prioritized for defense during a conflict? Which Soviet threats most oppose this strategy? Which would be the minimum essential targets for negation during a conflict?

Additionally, we can consider the AirLand Battle Doctrine. The AirLand Battle seeks to make maximum effectiveness of US ground and air forces to blunt Soviet attack. (11:3) In doing so, it combines the best parts of maneuver and deep strike into a defensive and an offensive strategy, but it will be very dependent on many sources of information for its success.

Which space systems provide critical intelligence, communications, navigation, and weather data to military

forces during its application? Which supplement other means of providing information? What priority should we establish in their defense? Are there Soviet space systems which pose threats so critical to the execution of the doctrine that they would require negation?

This systematic approach can easily be extended to develop specific objectives for a space control strategy. Once developed, these objectives must be carefully examined to identify only those most critical to executing the US military strategy. In an age of dwindling resources, we should seek to justify only those objectives which if not achieved represent an unacceptable risk to US military strategy.

3. What assumptions are necessary to building a space control strategy?

There are a myriad of possibilities. But, a few are reasonably certain to influence the development of our strategy more than others.

One, arms control has been and will continue to be an integral piece of the fabric of our national defense planning. We must seek to incorporate arms control as an instrument in our space control strategy. Can we limit threats to high altitude warning and communications satellites? What measures are

feasible to raise the threshold for attacks against satellites? (64:3) Can we guard against the covert development of ASAT capability? (64:9) What restraints are verifiable? Can we devise rules of the road in space similar to those used on the high seas to minimize the potential for mistakes and possible escalation into crisis? (32:xi) Which achievable and verifiable arms control objectives would most aid us in achieving our strategy?

It seems clear from the national debate that we should not conceive of arms control constraints on our military strategy options as complete restraint or none at all. (32:38) We seem to be at such a juncture for the US ASAT program. We have made progress on finding grounds to compromise with the Soviets on intermediate and strategic nuclear arms. Is there not a similar common ground which will allow us to assert our right to self defense in space?

Second, assume that military budgets will come under greater scrutiny in the future. As a consequence, our strategy must put maximum investment in existing capability; only incremental improvements are likely to be available in the near term. Which space systems are the most cost effective in supporting US military strategy? What alternatives exist to these systems so we can gracefully degrade in mission

capability when under attack? What innovative approaches can we adopt to help achieve our objectives with limited prospects of obtaining many new systems?

Thirdly, assume the military use of space will expand in the future to include other nations. While the US and the Soviet Union now dominate military space activities, others are expanding their space capability--the Europeans, Japan, China, India, etc. (14:11-12;58:105-121) When will these new emerging space powers become factors in the space control challenge?

Should we alter or improve our alliances to maximize achieving space control objectives by cooperating to combine capabilities? We already have an interoperable capability with our allies and their NATO III communications satellite and the shared use of the Defense Satellite Communications System (DSCS). (52:1) How will the expansion of commercial space activities, such as remote sensing, affect our military operations on earth?

4. What are our present capabilities? How should these be expanded?

Present capabilities for space control are limited. They have been developed incrementally from systems that were conceived

to support an environment in space unlike that which we will face in the future.

Space control demands a rapid exchange of information to support timely decision making. As a consequence, it requires a smoothly functioning command, control, communications and intelligence network. (33:23) This network supports the functional elements of the space control mission: assured access, surveillance, defense, and negation or denial of enemy objectives. Assured access demands expansion of the current US launch capability to include a balanced mix of reliable and readily available manned and unmanned space launch vehicles. (33:24)

Surveillance and intelligence information provide the foundation for space control--keys so necessary to make decisions regarding our ability to defend or to deny an enemy his ability to succeed. They are fundamental to providing timely attack warning against our space systems and for warning terrestrial forces of the threat posed to them by Soviet space systems. Adversaries must know that they are being observed, that if they do mount an attack it will be seen, and that the US has response options appropriate to the political and military circumstances surrounding the attack. (19:41)

The existing space surveillance network uses a variety of ground based optical and radar sensors to keep track of over 6,600 objects in space. (32:27) While accomplishing this function, it makes over 50,000 "contacts" or tracks of friendly and unfriendly space objects daily--from working satellites to a glove left in orbit by a former astronaut. Many of the sensors are contributing sensors which provide part time data for space surveillance. (32:25) Most use narrow beam tracking devices and may not provide the wide area surveillance of space so necessary for timely detection of potential attacks.

Any strategy for space control must carefully evaluate the total capability and capacity of the existing network, including its survivability, before making recommendations for improvement. Do we have sufficient coverage of deep space? Can we detect threats to satellites in geostationary orbit? How would space based surveillance of space provide more survivable and timely attack warning? (19:42)

How do we determine if an enemy has attacked one of our satellites with a laser or jamming devices? Operating in conjunction with our satellite control networks, could we determine if an individual satellite were under attack or had failed due to mechanical problems? How long would our attack

assessment take? What defensive actions could other spacecraft take, if any? (19:42)

Similarly, we must examine the capability of our satellites to react defensively given timely warning of attack. Are they in line of sight of an attacker? Could they avoid the attack? Is sufficient time available to react to an attack? What would be the effect on their mission? (19:42)

How should or would US National Command Authorities respond if attacked in space? If the Soviets attacked, would they simply lose the element of surprise to the tactical disadvantage of their terrestrial attack? (34:57)

As we ask these questions, it also seems prudent to examine the resiliency of existing spacecraft designs. Many satellites can combine their orbit location, constellation size, and survivability features to provide sufficient access for the time period needed to accomplish their respective missions. (62:7-8)

Key geostationary warning satellites have recently been upgraded with improved accuracy, reliability, and survivability features. (23:3) Communications satellites have evolved with an anticipation of growth in the threat. Phase III DSCS spacecraft include nuclear hardening and jam

resistance to provide connectivity to the US strategic alert force. (49:49-50;50:3) The interoperability of DSCS and NATO III spacecraft provides a resiliency in their ground networks. (52:1) The new Milstar satellite incorporates design features for survival against both physical and electronic threats. (10:5;51:1)

The programmed GPS system of 18 satellites in 10,900 nautical mile orbit was designed to gracefully degrade in accuracy while under attack and included design features for laser and nuclear hardening, as well as encrypted spread spectrum techniques for secure communication of its signals. (53:3)

Do they have sufficient on-board survivability features to survive an attack long enough to execute their mission?

Baseline survivability features in military satellites are often a principal element in the difference in cost over equivalent commercial designs. The vantage point of orbit location, redundancy, and survivability is already built into many existing systems, particularly those so necessary to support strategic forces worldwide.

So where does this capability assessment leave us in our attempt to build a strategy for space control? First, it is important to complete so the elements can be utilized in

proper combination and so deficiencies can be identified. Once identified, they can be corrected. However, it is also important to recognize that satellite and ground support system development times are long processes. Typical satellites take five to seven years to develop. Their on-orbit lifetimes are similarly as long, without affording an opportunity for access to retrofit new survivability features. (19:33) Therefore, our space control strategy must be robust enough to assure their operation even in the face of new, unforeseen threats.

Can we use tactical innovation to compensate for an inability to deny or degrade Soviet attacks? Could a small maneuver by low altitude spacecraft be effective at avoiding ground based sites in the Soviet Union, but still allow coverage of the area of the globe where the satellite supports US military objectives? Can we complete this action within existing and future intelligence cycle times and still be effective? (33:27)

What threat do Soviet RORSATs, EORSATs, imagery satellites, and ELINT satellites pose to US and allied forces? For how long? Can US and allied forces take evasive action in the face of such a threat?

Answers to these many tactical questions can very easily influence our strategy for achieving space control, however temporary or permanent be that task.

5. How much will the strategy cost?

Cost considerations have both an absolute and a relative dimension. As we discussed earlier, cost will be a major driver in a future of declining defense budgets. Therefore, the scrutiny we give to cost must be ever more vigorous. But, it also seems important to consider cost in all its dimensions. What is the incremental benefit of any part of the strategy to achieving our national security objectives? Are there more cost effective ways to achieve the same objective? What other military capability are we sacrificing in the process? Is it worth the relative cost? On a grand scale, is there a less costly way to achieve the same end with arms control measures?

Another perspective on cost that must be considered is the cost in terms of risk to national security. If we don't deploy an ASAT and fail to deny Soviet use of RORSATs and EORSATs from detecting and guiding attacks on US naval forces, have we compromised our national Maritime Strategy? Is it worth the incremental cost to the defense budget for a $40M ASAT, if it saves just one $18B carrier battle group? Can we

effectively employ a combination of tactics, defensive and offensive, to achieve an advantage of just hours in tactical surprise during the turnaround time between launches on a Soviet pad? (56:S10802)

Costs also become very practical drivers when deciding whether to use the existing force structure more effectively to achieve space control objectives or to develop a more robust force structure of satellites and launch capability. Such a venture will have a significant costs in time, as well as dollars, but might ultimately result in a better mix of forces against a well prepared adversary.

Such an assessment would trade off many interrelated elements. Satellite maneuver can help protect against ASAT attacks, but is a costly tactic which shortens the satellite lifetime and perturbs its orbit, possibly to a degree that it cannot complete its mission. Hardening can improve survivability against laser and nuclear effects, but may cause unacceptable weight and mission penalties. (64:10)

Defensive shootback is expensive and requires a very responsive, possibly global surveillance network to employ. Additionally, it adds to satellite weight, shortens mission lifetime, and increases system design risk. (64:10)

Selection of more survivable orbits, use of on-orbit spares, and changing current design philosophy to more proliferated satellites are costly investments in time and dollars. Acquiring a more robust launch capability for war time is a good ultimate goal, but first, the US must rectify its current launch difficulties. Use of redundant ground control sites has gained some acceptance, but again, such proliferation is costly. (64:10)

After discussing the groups of elements which can lead to building a space control strategy, it seems appropriate to also discuss criteria for assessing its potential utility. Crowl's "Six Questions Without Answers" provide a useful framework for such an assessment. (9:11-14) Are the objectives worth the costs? Is our space control strategy tailored to the objectives? What are the limits of military power? How strong is the home front? Is this new strategy well founded in history and are there significant differences about it such that historical parallels are not appropriate? Finally, we must add Crowl's wildcard: what have we overlooked?

Most of these questions will not have answers until we have completed the detailed assessment necessary for developing a comprehensive strategy. But they do provide a very sound

basis for its examination. Perhaps, one of these questions does deserve examination at this time, however. What have we overlooked?

We need to add one additional factor for building a space control strategy. That is the concept of the "future". (40:15) Any strategy which will guide our investment for new mission capability must also consider potential future changes in the world: power relationships, a different character of threat, new technologies, etc.

With a more sophisticated Soviet leadership and some progress along the lines of perestroika, we are likely to see a lessening in the perception of the Soviet threat--one which will have a direct effect on that harmony of objectives our strategy hopes to achieve among the military, the government, and the people. Additionally, we must consider the possibility of changing power relationships in the world of the future. How will these effect our strategy?

Some forecast fundamental changes in future global realities--some of which may be at variance with the US military strategy upon which we built our space control strategy. Some suggest that the US will be less preoccupied with a Soviet invasion of Central Europe or an all out nuclear exchange. We may see more conflict on the Soviet periphery

and in the Third World. We could develop more "discriminate responses" for military action in the future. (7:II,7)

The recent Commission on an Integrated Long-Term Strategy envisions such a world and made several recommendations regarding the composition and utilization of future military forces in a world of changing power relationships. It envisioned a US force posture ready to respond globally to a wide range of military contingencies and the need for new, highly accurate conventional weapons which can strike military targets with surgical precision. (24:2)

The commission further recommended expanding US capabilities for executing deep offensive thrusts beyond enemy front lines; the increased use of standoff weapons to blunt attacks around the perimeter of the Soviet Union; and exploring the potential of our allies to operate in areas beyond traditional alliance borders. (24:2-3) Such weapons will need precise targeting information. What better way to rapidly transmit that data than with space systems? What better way to assist our allies when operating beyond familiar areas than to supply them data via real time satellite links?

This new strategy is not yet officially accepted and raises many questions about current and future capabilities which must be debated on their respective merits. It does, however,

point out the need to make maximum utility of existing and planned force structure in an integrated sense to respond to a variety of unforeseen contingencies. As a piece of that military capability, it seems clear that space systems are likely to be further integrated with military operations worldwide--increasing their potential value in achieving military objectives and, as a consequence, their value as military targets in the minds of our adversaries. (32:6)

The commission made specific recommendations about our military space systems: increasing US capability to replenish space systems during war; measures to mitigate Soviet advantages of proliferation and surge capability in space; use of space based surveillance to provide timely and survivable warning of attack on US satellites; and developing a conventional capability to attack Soviet satellites at all altitudes and their associated satellite ground control nodes. (24:54) These recommendations have obvious strategy and cost implications which were not considered in the analysis above. Once accepted, how would we incorporate such changes into our space control strategy?

# CHAPTER VI

## SUMMARY AND CONCLUSIONS

The task before us is formidable--but important, if we are to meet the challenge of a resilient and sophisticated adversary. Many of the tradeoffs among elements of the strategy will occur at the tactical level. Many of the tradeoffs must be carefully evaluated against national policy and available resources. Perhaps this is the most challenging aspect of the task.

On February 11, 1988, the White House Press Secretary released the outline of a new National Space Policy. Among its many provisions are the following key goals and directives which affect the space control mission.

> - The United States will pursue activities in space in support of its inherent right of self-defense and its defense commitments to its allies. (67:2)
>
> -- The Department of Defense will develop, operate, and maintain enduring space systems to ensure its freedom of action in space. This requires an integrated combination of antisatellite, survivability, and surveillance capabilities.
>
> -- [The] Department of Defense will develop and deploy a robust and comprehensive ASAT capability ...with initial operational capability at the earliest possible date.
>
> -- Department of Defense space programs will pursue a survivability enhancement program with long-term planning for future requirements. The Department of

Defense must provide for the survivability of selected, critical national security assets (including associated terrestrial components) to a degree commensurate with the value and utility of the support they provide to national-level decision functions, and military operational forces across the spectrum of conflict.

-- The United States will develop and maintain an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems. (67:8)

These goals and guidelines demand a coherent military strategy. They will also demand a succinct statement of that strategy--much like our national Maritime Strategy--if we are to successfully muster support for the evolution in military capability necessary to carry them out.

How will we articulate the need for assured access to space, a comprehensive surveillance capability to detect attacks, sufficient defensive capability to survive long enough to complete our mission, and the proper capability to selectively deny an enemy a sanctuary in space, if so directed? We must define simple, coherent arguments for their advocacy.

Whatever our course of action, it seems abundantly clear that many challenges confront our approach to this task. War and deterrence of war are multi-environmental, combined arms issues. (15:40) We simply must find ways to protect those elements of our national strategy sufficiently long enough for

them to execute their respective missions--be they spacecraft or air, land, or sea forces vulnerable to detection and targeting from space. The US cannot unilaterally declare a benign environment in space. (15:42) Nor can we heroically protect all elements of our force structure as if they are expected to be immortal. (15:41)

However, we must recognize that there is no information so valuable to a commander as knowing his enemy's location, its strength, and his own force disposition. And space is dramatically contributing to that knowledge. As Admiral Bobby Inman (USN, Ret) recently pointed out, there will come a day in the not too distant future when all the earth, its seas to depths of 100 feet, and its atmosphere and the space surrounding it will be subject to continuous surveillance by space platforms. This circumstance will change the character of force projection and warfare in dramatic fashion. (20:48) Such is the focus of the true challenge of space control. Space system utility and dependency is growing for both friend and adversary--as is the value of the targets which reside in space.

Can we afford to wait until conflict begins before we repeat the fateful lessons of aerial combat in World War I?

> At first few of the reconnaissance planes were equipped with guns. Consequently when Allied reconnaissance fliers met German reconnaissance pilots in the air they usually waved at each other and went about the assignments unhampered. As the war continued, however, the British, French, Germans, and Americans realized that aerial intelligence was actually changing the course of the war, dictating tactics, and affecting planning. When they came to understand the immense value of these daily unarmed flights, each side became determined to stop the other. (25:35)

We stand at a similar juncture in military history. Numerous options lie before us. We can do nothing--and possibly abrogate our responsibility as a great power. We can react to Soviet initiative--a costly tactic in time, resources, and risk. We can attempt to pursue a policy of space superiority--probably not feasible either fiscally or politically. Or--in an age of "obligatory arms control"--we can blend US technology and politics to weave a sound strategy for our national security. (39:122)

The first step is to do more with today's resources. The next is to build on that foundation. We need an overarching strategy to ensure that we heed the famous guidance of Karl von Clausewitz, "The government establishes the political purpose, the military provides the means for achieving the political end, and the people provide the will, the 'engines of war'." (8:42)

Now--is the time to step out and embrace this challenge.

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## GLOSSARY

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|---|---|---|
| ASAT | - | Antisatellite |
| CINC | - | Commander in Chief |
| DSCS | - | Defense Satellite Communications System |
| EKRAN | - | Soviet television satellite |
| ELINT | - | Electronic intelligence |
| EORSAT | - | Soviet electronic ocean reconnaissance satellite |
| ESA | - | European Space Agency |
| glasnost | - | Publicity or openness |
| GLONASS | - | Soviet navigation satellite |
| GPS | - | Global Positioning System |
| ICBM | - | Intercontinental ballistic missile |
| INF | - | Intermediate range nuclear force |
| Milstar | - | Military communications satellite |
| MIR | - | Soviet manned space station |
| MOS-1 | - | Japanese thermal imaging satellite |
| NATO | - | North Atlantic Treaty Organization |
| perestroika | - | Restructuring |
| Proton | - | Soviet space booster |
| RORSAT | - | Soviet radar ocean reconnaissance satellite |
| SDI | - | Strategic Defense Initiative |